

REMARKS

The Examiner is thanked for the thorough examination of this application. The Office Action, however, tentatively rejected all claims 1-12. Specifically, the Office Action rejected claims 1-6 under 35 U.S.C. § 103(a) as allegedly unpatentable over the combination of Admitted Prior Art (APA) in view of Make (US 2003/0146909) and Ahn (US 7,015,889). The Office Action rejected claims 7-12 under 35 U.S.C. § 103(a) as allegedly unpatentable over the combination of Koyama (JP 11-167373) in view of Ahn and APA. In response, Applicant has amended independent claims 1 and 7. These amendments to the independent claims render the rejections moot.

Notwithstanding, Applicant sets forth additional distinctions below. For at least the reasons set forth herein, Applicant respectfully requests reconsideration and withdrawal of the rejections.

Independent claim 1, as amended, recites:

1. A data driver for driving a plurality of data lines on an LCD panel according to a plurality of channels of pixel data, the data driver comprising:
 - a digital buffer for receiving and storing the channels of the pixel data, and selectively outputting a channel of the pixel data per time;
 - a DAC (digital-to-analog converter) for sequentially converting the channels of the pixel data output from the digital buffer into a plurality of channels of analog pixel data and outputting a channel of the analog pixel data per time;*
 - a plurality of analog buffer units, each analog buffer unit sequentially receiving and storing a channel of the analog pixel data output from the DAC, the analog buffer units outputting the channels of analog pixel data stored therein simultaneously;* and
 - an output buffer for receiving the channels of the analog pixel data output from the analog buffer units so as to drive the data lines.

(*Emphasis added.*) Claim 1 patently defines over the cited art for at least the reason that the cited references fail to disclose the features emphasized above.

In this regard, a feature of the embodiments of claim 1 that clearly defines over the cited art relates to the management of a single DAC to convert pixel data of a plurality of channels, and output that converted data to a plurality of analog buffer units (one at a time), and thereafter to output the data from the plurality of analog buffer units at a single time (e.g., in parallel fashion). Claim 1 is amended herein to more clearly define this distinguishing feature.

Turning to the cited Ahn and Maki references, Ahn clearly does not disclose this feature, as Ahn discloses a dedicated DAC for each channel (e.g., one DAC per buffer), as illustrated in, for example, FIG. 2 of Ahn. Maki illustrates the management of a single DAC to convert R, G, & B image data (from three separate R, G, and B inputs sources).

Maki similarly fails to show these claimed features. As described in Maki (and illustrated in FIG. 2), a control circuit 60 controls the timing of switches 41-43 and corresponding switches 51-53. As described in paragraph [0031] of Maki, “switches 51-53 are controlled by the control circuit 60 to synchronize with switching timings of the switches 41-43.” Paragraph [0029] of Maki states that “the control circuit 60 [controls] the switches [such that switches] 41-43 successively select image data of three channels R, G, and B...” Thus, as switch 41 is closed, corresponding switch 51 is similarly closed. Then switches 42 and 43, and corresponding switches 52 and 53 are correspondingly closed.

In contrast, claim 1 (as amended herein) requires: (1) *“a DAC (digital-to-analog converter) for sequentially converting the channels of the pixel data output from the digital buffer into a plurality of channels of analog pixel data and outputting a channel of the analog pixel data per time”* and (2) *“the analog buffer units outputting the channels of analog pixel*

data stored therein simultaneously.” That is, the DAC sequentially converts the pixel data from the plurality of channels over a plurality of discrete times. However, all of the plurality of analog buffer units output the analog pixel data in a parallel fashion, and not in a successive (or sequential) fashion. These features clearly define over the cited art, and for at least this reason, the rejections of independent claim 1 should be withdrawn. As claims 2-4 each depend from claim 1, these claims should be allowed as well.

The Office Action rejected independent claim 7 under 35 U.S.C. § 103(a) as allegedly unpatentable over the combination of Koyama (JP 11-167373) in view of Ahn and APA. Applicant respectfully disagrees.

As with claim 1, independent claim 7 has been amended to recite:

7. A data driver for driving a plurality of data lines on an LCD panel according to a plurality of channels of pixel data, the data driver comprising:

a digital buffer for receiving and storing the channels of the pixel data, and selectively outputting N channels of the pixel data per time, wherein N is a positive integer greater than 1 and smaller than the number of the data lines;

N DACs (digital-to-analog converters) for converting the channels of the pixel data output from the digital buffer into a plurality of channels of analog pixel data, and outputting N channels of the analog pixel data per time;

a plurality of analog buffer units, each analog buffer unit receiving and storing a channel of the analog pixel data respectively output from the N DACs, and the analog buffer units outputting the channels of the analog pixel data stored therein simultaneously; and

an output buffer for receiving the channels of the analog pixel data output from the analog buffer units so as to drive the data lines.

(*Emphasis added.*) Claim 7 patently defines over the cited art for at least the reason that the cited art fails to disclose the features emphasized above.

The Office Action admitted that Koyama fails to disclose the claimed “analog buffer for receiving...”, but cited the Ahn reference as allegedly teaching this feature. As described above in connection with claim 1, Applicant as amended this element to define “*a plurality of analog buffer units, each analog buffer unit receiving and storing a channel of the analog pixel data respectively output from the N DACs, and the analog buffer units outputting the channels of the analog pixel data stored therein simultaneously,*” which clearly defines over the teachings of the Ahn reference. For at least this reason, independent claim 7 defines over the cited art. As claims 8-10 (depending therefrom) patently define over the cited art for at least the same reason.

As a separate and independent basis for the patentability of all claims, Applicant respectfully traverses the rejections as failing to identify a proper basis for combining the cited references. For example, in combining Ahn with Maki, the Office Action stated only that the combination would have been obvious “in order to reduce output deviations.” (Office Action, page 3). Similarly, in combining Ahn with Koyama, the Office Action alleged that the combination would have been obvious “in order to enhance capability for driving the data lines.” (Office Action, p. 5). These alleged motivations are clearly improper in view of well-established Federal Circuit precedent.

It is well-settled law that in order to properly support an obviousness rejection under 35 U.S.C. § 103, there must have been some teaching in the prior art to suggest to one skilled in the art that the claimed invention would have been obvious. W. L. Gore & Associates, Inc. v. Garlock Thomas, Inc., 721 F.2d 1540, 1551 (Fed. Cir. 1983). More significantly,

“The consistent criteria for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this [invention] should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art. ...” Both the suggestion and the expectation of success must be founded in

the prior art, not in the applicant's disclosure... In determining whether such a suggestion can fairly be gleaned from the prior art, the full field of the invention must be considered; for the person of ordinary skill in the art is charged with knowledge of the entire body of technological literature, including that which might lead away from the claimed invention."

(*Emphasis added.*) In re Dow Chemical Company, 837 F.2d 469, 473 (Fed. Cir. 1988).

In this regard, Applicant notes that there must not only be a suggestion to combine the functional or operational aspects of the combined references, but that the Federal Circuit also requires the prior art to suggest both the combination of elements and the structure resulting from the combination. Stiftung v. Renishaw PLC, 945 Fed.2d 1173 (Fed. Cir. 1991). Therefore, in order to sustain an obviousness rejection based upon a combination of any two or more prior art references, the prior art must properly suggest the desirability of combining the particular elements to derive a data driver, as claimed by the Applicant.

When an obviousness determination is based on multiple prior art references, there must be a showing of some "teaching, suggestion, or reason" to combine the references. Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir. 1997) (also noting that the "absence of such a suggestion to combine is dispositive in an obviousness determination").

Evidence of a suggestion, teaching, or motivation to combine prior art references may flow, inter alia, from the references themselves, the knowledge of one of ordinary skill in the art, or from the nature of the problem to be solved. See In re Dembiczak, 175 F.3d 994, 1000, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Although a reference need not expressly teach that the disclosure contained therein should be combined with another, the showing of combinability, in whatever form, must nevertheless be "clear and particular." Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617.

If there was no motivation or suggestion to combine selective teachings from multiple prior art references, one of ordinary skill in the art would not have viewed the present invention as obvious. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); Gambro Lundia AB, 110 F.3d at 1579, 42 USPQ2d at 1383 (“The absence of such a suggestion to combine is dispositive in an obviousness determination.”).

Significantly, where there is no apparent disadvantage present in a particular prior art reference, then generally there can be no motivation to combine the teaching of another reference with the particular prior art reference. Winner Int'l Royalty Corp. v. Wang, No 98-1553 (Fed. Cir. January 27, 2000).

For at least the additional reason that the Office Action failed to identify proper motivations or suggestions for combining the various references to properly support the rejections under 35 U.S.C. § 103, those rejections should be withdrawn.

New Claim 13

Independent claim 13 is newly added and defines a method that is neither taught nor suggested by the cited art of record.

Conclusion

For the reasons as described above, Applicant believes that all pending claims are in condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

No fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

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